REMARKS

Upon entry of the present amendment, claims 1-3 and 7-9 will remain pending in the above-identified application and stand ready for further action on the merits.

The amendments made herein to the claims do not incorporate new matter into the application as originally filed, since support for each of the claims may be found in original figure 1.

Claim Rejections Under 35 USC § 102/103

Claims 1 and 3 have been rejected under 35 USC § 102(b) over Jensen (US 3,969,540), and claims 1-3 have been rejected under 35 USC § 103(a) over Jensen (US '540). Still further, claims 1-3 have been rejected under 35 USC § 103(a) over Ashmead (US 4,172,072). Reconsideration and withdrawal of each of these rejections are respectfully requested based upon the following considerations.

Distinctions over Jensen (US 3,969,540)

With respect to its intended objects, the present invention is different from the patent to Jensen (US 3,969,540), as follows. The object of the present invention is to provide zinc-oligopeptides that can be easily absorbed by the body to improve the response to insulin, levels of which are reduced by the deficiency of zinc in the body. In contrast, the Jensen patent aims to provide metal proteinate precipitates in which naturally

occurring vitamins and hormones are undestroyed, by enzymatically digesting a proteinaceous material (see lines 47-50 of column 1 of Jensen US '540).

The claimed method of preparing the zinc-oligopeptide according to the present invention comprises the steps of suspending protein in deionized water to prepare a suspension of protein; proteolyzing the protein suspension in the presence of a protease to give a mixture of oligopeptides (hexa~deca-aminate); chelating zinc ions with the mixture of oligopeptides to give a zinc-oligopeptide solution; and concentrating and drying the zinc-oligopeptide solution to a zinc-oligopeptide powder.

The metal proteinate of the Jensen US '540 patent, as asserted by the USPTO, is prepared by suspending a protein source in water, incompletely digesting the protein source with a proteinase, adjusting the pH of the resulting protein hydrolysate solution to slightly alkaline pH values, and precipitating the hydrolyzed peptide mixture with metal salts. Such that there is formed a metal-subpolypeptide.

By comparing the preparation methods as described above, the USPTO can easily see that the zinc-oligopeptides of the present invention are completely different from the metal proteinates of the Jensen US '540 patent, which is also evidenced by the following facts.

The zinc-oligopeptides of the present invention are produced by chelating zinc ions with oligopeptides that are enzymatic digestion products of proteins. In contrast, the metal proteinates of the Jensen patent are formed from polypeptides that are incompletely hydrolyzed products of proteins, wherein the disclosed extent of the enzymatic digestion of the proteins is vague at best (see lines 51-56 of column 1 and lines 8-10 and 16-18 of column 2 of Jensen US '540).

That is, the present invention employs oligopeptides, whereas the cited Jensen US '540 reference uses polypeptides.

There is in the cited Jensen reference no mention of the use of oligopeptides as the hydrolysate. Moreover, the production of different hydrolysates in the present invention versus the Jensen US '540 patent results from a difference in the reaction times of the enzymatic digestion of a proteinaceous material between the present invention and the Jensen US '540 patent.

In this respect, in the present invention, the enzymatic digestion reaction requires 10 to 12 hours, whereas in the cited Jensen reference, the reaction is carried out over a, relatively speaking, much broader range of from about 2 hours to about 5 days (see line 68 of column 2 to line 1 of column 3 of Jensen US '540).

In the Jensen US '540 patent, the step of suspending a protein source in water (the first step) and the step of incompletely

digesting the protein source with a protease (the second step) are utilized to prevent free amino acids from forming.

Typically, proteins are degraded partially (as in the present invention), or completely. However, in the Jensen US '540 patent, the incomplete enzymatic digestion of the proteins leads to an impossible separation of the incompletely digested hydrolysate and the undigested hydrolysate. For this reason it is believed that in the Jensen US '540 patent, the bivalent metals are added in the form of salts to the enzymatically digested mixture, in order to facilitate isolation of polypeptides produced by the incomplete digestion. As such, it is also submitted that the polypeptides of the Jensen US '540 patent do not refer to oligopeptides that are products generated by partial digestion of proteins.

It is further noted that with respect to metal ions used for chelation of the enzymatic digestion products of proteins, the present invention uses zinc ions, while the Jensen US '540 patent employs inorganic salts (e.g., sodium hydroxide, ferrous sulfate, etc.) (see lines 37-39 of column 2 and the Examples of Jensen US '540).

In accordance with examples of the present invention and the Jensen US '540 patent, the zinc-oligopeptides of the present invention are in a liquid phase, whereas the metal proteinates of Jensen US '540 are solid precipitates. That is, in the Jensen US '540 patent, the protein is precipitated by the addition of

bivalent metal salts, where by-products such as sodium chloride or sodium sulfate are generated. Therefore, the resulting precipitates of the Jensen US '540 patent should be filtered to remove such impurities.

Based upon the above considerations, it is clear that the cited Jensen US '540 patent is incapable of either anticipating or rendering obvious the invention presently claimed. In this regard, the Jensen US '540 patent nowhere teaches or discloses the methods instantly claimed, and in no way provides any motivation to those of ordinary skill in the art to arrive at the same.

Distinctions Over Ashmead (US 4,172,072)

In connection with the cited patent to Ashmead (US 4,172,072), the USPTO asserts that two tripeptides practically function as a hexapeptide. The present Inventor does not agree with this assertion of the USPTO for the following reasons.

Tripeptides, dipeptides and free amino acids according to the Ashmead US '072 patent cannot chelate bivalent metal ions. When tripeptides, dipeptides and free amino acids bind to bivalent metal ions, mineral ditripeptides (mineral hexaaminates), mineral didipeptides (mineral tetraaminates) and mineral diaminates, respectively, are formed. All of these products are aminates capable of ionizing in an aqueous solution. Therefore, any formed

aminate would have a totally different structure from a chelate according to the present invention.

Furthermore, it is submitted that in the aminate compound disclosed in the Ashmead US '072 patent, some amino acids interact with mineral ions and the others do not, and carboxyl radicals or amine radicals positioned at α-carbons of amino acids do not react with mineral ions, but participate in only formation of peptide bonds. Therefore, it would be improper or wrong for the USPTO to assume in setting forth any rejection of the instant claims, that in the Ashmead US '072 patent all amino acids of tripeptides and dipeptides participate in formation of an aminate structure.

Accordingly, based upon the above considerations, it is clear that the cited Ashmead US '072 patent is incapable of rendering obvious the present invention as claimed. In this respect, nowhere in the cited Ashmead reference is there provided any motivation that would allow those of ordinary skill in the art to arrive at the present invention as claimed. Absent such motivation in the cited art, the USPTO's rejection over the same under 35 USC § 103 cannot be sustained.

CONCLUSION

Based upon the amendments made herein, as well as the remarks presented, the Examiner is respectfully requested to issue a Notice of Allowance, clearly indicating that each of the pending claims 1-

3 and 7-9 presented herein are allowed and patentable under the provisions of Title 35 of the United States Code.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact John W. Bailey (Reg. No. 32,881) at the telephone number below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By _____
John W. Bailey, #32,881

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

JWB/end
0655-0114P

Attachment: Version with Markings to Show Changes Made

(Rev. 02/20/02)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 7-9 have been added.